

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>TS 1195 PCT</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/EP 03/06449</b>	International filing date ( <i>day/month/year</i> ) <b>18.06.2003</b>	Priority date ( <i>day/month/year</i> ) <b>26.06.2002</b>
International Patent Classification (IPC) or both national classification and IPC <b>C07C1/04</b>		
Applicant <b>SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V.</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
 

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:
 

I ☒ Basis of the opinion

II ☐ Priority

III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

IV ☐ Lack of unity of invention

V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

VI ☐ Certain documents cited

VII ☐ Certain defects in the international application

VIII ☐ Certain observations on the international application

Date of submission of the demand  <b>23.01.2004</b>	Date of completion of this report  <b>27.07.2004</b>
Name and mailing address of the international preliminary examining authority:  <div style="display: flex; align-items: center;"> <div>             European Patent Office              D-80298 Munich              Tel. +49 89 2399 - 0 Tx: 523656 epmu d              Fax: +49 89 2399 - 4465           </div> </div>	Authorized Officer  <b>Breimaier, W</b>  Telephone No. +49 89 2399-8327



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/EP 03/06449**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-25 as originally filed

**Claims, Numbers**

1-18 received on 01.07.2004 with letter of 01.07.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP 03/06449

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**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-17
	No: Claims	18
Inventive step (IS)	Yes: Claims	
	No: Claims	1-17
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

D1 : US-A 4 424 282

D2 : US-A 3 930 812

D3 : DE-A 25 06 199

**novelty**

1. The subject-matter according to claims 1-17 is novel pursuant to art. 33(2) PCT.

The present invention concerns a Fischer Tropsch process for making "normally liquid and normally solid" (see under further remarks) hydrocarbons in at least two reactors using Fischer Tropsch liquid product as cooling fluidum according to claim 1.

In the prior art documents D1 to D3 methanation within one reactor is described using in particular water as cooling fluidum (see D1, column 1, line 63 to column 2, line 17, examples 1, 2, claim 1; see D2, column 2, lines 5-14, claim 1, figure; see D3, examples, claims 1 and 2). In addition, in D1 also liquid hydrocarbons are formed (see example 2) and the use of a cut of saturated hydrocarbons is used as cooling fluidum (see in example 3) and in D3 the use of normally liquid hydrocarbons as cooling fluidum is described (see page 6, lines 7 and 8 and page 11, second paragraph).

Thus, the present invention mainly differs from the above described processes by the fact that the process is carried out in at least two reactors using hydrocarbons as the cooling fluidum. Novelty is therefore given.

2. The subject-matter according to claim 18 is not novel pursuant to art. 33(2) PCT.

Any apparatus comprising at least two reactor sections having each at least one inlet and one outlet can be regarded as novelty-destroying for the reactor suitable for carrying out the present process according to claim 18. Since such a reactor is well-known to the skilled person, novelty is not given.

**inventive step**

3. The subject-matter according to claims 1-18 seems not to be inventive pursuant to art. 33(3) PCT.

In view of the prior art on pages 5 to 8 of the description, the problem posed is the provision of an improved Fischer Tropsch process for making liquid and solid hydrocarbons. This is essentially solved by running the Fischer Tropsch reaction in at

least two reactors using the liquid reaction product as cooling fluidum according to claim 1.

The document D3 discloses a Fischer-Tropsch process using direct cooling with water; liquid hydrocarbons are suggested as equivalent cooling fluidum in order to deal with its high heat of reaction (see D3 as outlined above). Multi-stage reactors with heat removal between stages are also known in Fischer Tropsch performances (see eg D2, column 1). Thus, it appears to be obvious to the skilled person to use hydrocarbons as cooling fluidum in at least two reactors in order to solve the problem posed, ie to provide a method in order to increase selectivities to higher hydrocarbons and/or thermal efficiencies. In addition, it is noted that none of the alleged advantages of the present performance as stated on present pages 12 and 13 of the description has actually been demonstrated to be present. No example is available from the application document. Thus these advantages cannot be taken into account for assessing inventive step.

**further remarks**

- The relative term "**normally** liquid and **normally** solid" hydrocarbons used in claim 1 has no well-recognised meaning and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT.
- Some of the features in the apparatus claim 18 relate to a method of using the apparatus rather than clearly defining the apparatus in terms of its technical features. The intended limitations are therefore not clear from this claim, contrary to the requirements of Article 6 PCT.
- Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1-D3 is not mentioned in the description, nor are these documents identified therein.
- A document reflecting the prior art described on pages 8/9 is not identified in the description (Rule 5.1(a)(ii) PCT).
- The description is not adapted to the claims.